

## Appendix F

# Results from Side Cases

**Table F1. Key Results for Residential Sector Technology Cases**

Energy Consumption	1999	2005				2010			
		2001 Technology	Reference Case	High Technology	Best Available Technology	2001 Technology	Reference Case	High Technology	Best Available Technology
<b>Energy Consumption (quadrillion Btu)</b>									
Distillate Fuel .....	0.86	0.89	0.88	0.85	0.82	0.82	0.81	0.74	0.69
Kerosene .....	0.10	0.09	0.08	0.08	0.08	0.08	0.07	0.07	0.06
Liquefied Petroleum Gas .....	0.46	0.46	0.45	0.44	0.43	0.43	0.41	0.39	0.37
Petroleum Subtotal .....	1.42	1.44	1.42	1.37	1.33	1.33	1.29	1.20	1.12
Natural Gas .....	4.85	5.49	5.46	5.30	4.92	5.74	5.69	5.37	4.52
Coal .....	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Renewable Energy .....	0.41	0.43	0.43	0.40	0.40	0.44	0.43	0.39	0.38
Electricity .....	3.91	4.51	4.50	4.45	4.28	5.05	4.96	4.86	4.43
<b>Delivered Energy</b> .....	<b>10.62</b>	<b>11.93</b>	<b>11.86</b>	<b>11.57</b>	<b>10.98</b>	<b>12.61</b>	<b>12.43</b>	<b>11.87</b>	<b>10.50</b>
Electricity Related Losses .....	8.48	9.49	9.45	9.36	9.00	10.03	9.87	9.67	8.81
<b>Total</b> .....	<b>19.10</b>	<b>21.41</b>	<b>21.31</b>	<b>20.94</b>	<b>19.98</b>	<b>22.64</b>	<b>22.30</b>	<b>21.53</b>	<b>19.31</b>
<b>Delivered Energy Consumption per Household (million Btu per household)</b> ... 102.1      107.0      106.4      103.8      98.5      107.8      106.3      101.5      89.8									

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports. Side cases were run without the fully integrated modeling system, so not all feedbacks are captured. The reference case ratio of electricity losses to electricity use was used to compute electricity losses for the technology cases.

Source: Energy Information Administration, AEO2001 National Energy Modeling System, runs RSFRZN.D101800A, AEO2001.D101600A, RSHIGH.D101800A, and RSBEST.D101800A

**Table F2. Key Results for Commercial Sector Technology Cases**

Energy Consumption	1999	2005				2010			
		2001 Technology	Reference Case	High Technology	Best Available Technology	2001 Technology	Reference Case	High Technology	Best Available Technology
<b>Energy Consumption (quadrillion Btu)</b>									
Distillate Fuel .....	0.36	0.41	0.41	0.41	0.40	0.41	0.41	0.40	0.39
Residual Fuel .....	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11
Kerosene .....	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Liquefied Petroleum Gas .....	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Motor Gasoline .....	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Petroleum Subtotal .....	0.59	0.66	0.66	0.66	0.65	0.67	0.67	0.66	0.65
Natural Gas .....	3.15	3.72	3.71	3.70	3.64	3.90	3.88	3.85	3.75
Coal .....	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Renewable Energy .....	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Electricity .....	3.70	4.36	4.35	4.30	4.05	4.93	4.89	4.77	4.26
<b>Delivered Energy</b> .....	<b>7.59</b>	<b>8.89</b>	<b>8.87</b>	<b>8.82</b>	<b>8.49</b>	<b>9.66</b>	<b>9.59</b>	<b>9.44</b>	<b>8.82</b>
Electricity Related Losses .....	8.01	9.16	9.14	9.05	8.52	9.81	9.71	9.49	8.48
<b>Total</b> .....	<b>15.61</b>	<b>18.04</b>	<b>18.00</b>	<b>17.86</b>	<b>17.02</b>	<b>19.46</b>	<b>19.30</b>	<b>18.92</b>	<b>17.29</b>
<b>Delivered Energy Consumption per Square Foot (thousand Btu per square foot)</b> ... 120.9      125.4      125.2      124.4      119.9      127.5      126.6      124.6      116.4									

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports. Side cases were run without the fully integrated modeling system, so not all feedbacks are captured. The reference case ratio of electricity losses to electricity use was used to compute electricity losses for the technology cases.

Source: Energy Information Administration, AEO2001 National Energy Modeling System, runs COMFRZN.D101800C, AEO2001.D101600A, COMHIGH.D101700A, and COMBEST.D101700A

## Results from Side Cases

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**Table F1. Key Results for Residential Sector Technology Cases (Continued)**

2015				2020				Annual Growth 1999-2020			
2001 Technology	Reference Case	High Technology	Best Available Technology	2001 Technology	Reference Case	High Technology	Best Available Technology	2001 Technology	Reference Case	High Technology	Best Available Technology
0.80	0.77	0.69	0.61	0.80	0.75	0.65	0.56	-0.4%	-0.7%	-1.4%	-2.1%
0.07	0.07	0.06	0.06	0.07	0.07	0.06	0.05	-1.4%	-1.7%	-2.6%	-3.0%
0.42	0.40	0.37	0.33	0.42	0.39	0.36	0.31	-0.4%	-0.7%	-1.2%	-1.8%
1.30	1.24	1.12	1.00	1.29	1.21	1.06	0.92	-0.4%	-0.7%	-1.4%	-2.0%
6.05	5.99	5.54	4.21	6.39	6.30	5.73	4.05	1.3%	1.3%	0.8%	-0.9%
0.05	0.05	0.04	0.04	0.05	0.05	0.04	0.04	0.7%	0.5%	-0.6%	-0.6%
0.45	0.43	0.38	0.37	0.47	0.44	0.37	0.36	0.7%	0.4%	-0.3%	-0.6%
5.51	5.37	5.20	4.55	6.01	5.80	5.57	4.80	2.1%	1.9%	1.7%	1.0%
<b>13.37</b>	<b>13.08</b>	<b>12.28</b>	<b>10.17</b>	<b>14.20</b>	<b>13.81</b>	<b>12.77</b>	<b>10.16</b>	<b>1.4%</b>	<b>1.3%</b>	<b>0.9%</b>	<b>-0.2%</b>
10.46	10.19	9.87	8.64	10.92	10.55	10.12	8.73	1.2%	1.0%	0.8%	0.1%
<b>23.83</b>	<b>23.27</b>	<b>22.15</b>	<b>18.81</b>	<b>25.12</b>	<b>24.36</b>	<b>22.89</b>	<b>18.89</b>	<b>1.3%</b>	<b>1.2%</b>	<b>0.9%</b>	<b>-0.1%</b>
<b>108.5</b>	<b>106.2</b>	<b>99.7</b>	<b>82.6</b>	<b>109.7</b>	<b>106.7</b>	<b>98.6</b>	<b>78.5</b>	<b>0.3%</b>	<b>0.2%</b>	<b>-0.2%</b>	<b>-1.2%</b>

**Table F2. Key Results for Commercial Sector Technology Cases (Continued)**

2015				2020				Annual Growth 1999-2020			
2001 Technology	Reference Case	High Technology	Best Available Technology	2001 Technology	Reference Case	High Technology	Best Available Technology	2001 Technology	Reference Case	High Technology	Best Available Technology
0.41	0.40	0.39	0.38	0.40	0.39	0.38	0.37	0.5%	0.4%	0.3%	0.2%
0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.4%	0.4%	0.4%	0.4%
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.6%	0.6%	0.6%	0.6%
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.0%	1.0%	1.0%	1.0%
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-0.5%	-0.5%	-0.5%	-0.5%
0.67	0.67	0.66	0.65	0.66	0.66	0.65	0.64	0.5%	0.5%	0.4%	0.3%
4.07	4.05	4.00	3.87	4.14	4.13	4.07	3.93	1.3%	1.3%	1.2%	1.1%
0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.7%	0.7%	0.7%	0.7%
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.0%	0.0%	0.0%	0.0%
5.42	5.32	5.14	4.48	5.78	5.61	5.38	4.65	2.2%	2.0%	1.8%	1.1%
<b>10.32</b>	<b>10.19</b>	<b>9.96</b>	<b>9.15</b>	<b>10.74</b>	<b>10.55</b>	<b>10.25</b>	<b>9.37</b>	<b>1.7%</b>	<b>1.6%</b>	<b>1.4%</b>	<b>1.0%</b>
10.28	10.10	9.76	8.51	10.51	10.20	9.78	8.45	1.3%	1.2%	1.0%	0.3%
<b>20.60</b>	<b>20.29</b>	<b>19.72</b>	<b>17.66</b>	<b>21.25</b>	<b>20.75</b>	<b>20.03</b>	<b>17.82</b>	<b>1.5%</b>	<b>1.4%</b>	<b>1.2%</b>	<b>0.6%</b>
<b>129.6</b>	<b>128.0</b>	<b>125.1</b>	<b>115.0</b>	<b>131.1</b>	<b>128.8</b>	<b>125.1</b>	<b>114.4</b>	<b>0.4%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>-0.3%</b>

## Results from Side Cases

**Table F3. Key Results for Industrial Sector Technology Cases**

Consumption	1999	2010			2015			2020		
		2001 Technology	Reference Case	High Technology	2001 Technology	Reference Case	High Technology	2001 Technology	Reference Case	High Technology
<b>Energy Consumption (quadrillion Btu)</b>										
Distillate Fuel .....	1.07	1.29	1.27	1.25	1.39	1.35	1.33	1.50	1.44	1.41
Liquefied Petroleum Gas	2.32	2.54	2.50	2.48	2.70	2.65	2.62	2.89	2.83	2.79
Petrochemical Feedstocks	1.29	1.55	1.53	1.52	1.63	1.61	1.59	1.73	1.70	1.67
Residual Fuel .....	0.22	0.27	0.25	0.24	0.29	0.26	0.24	0.32	0.27	0.25
Motor Gasoline .....	0.21	0.25	0.25	0.24	0.27	0.26	0.26	0.29	0.28	0.28
Other Petroleum .....	4.29	4.83	4.76	4.72	5.11	5.01	4.94	5.38	5.24	5.15
Petroleum Subtotal .....	9.39	10.73	10.55	10.45	11.40	11.14	10.98	12.11	11.77	11.55
Natural Gas .....	9.43	11.50	11.11	10.90	12.29	11.76	11.42	13.01	12.34	11.88
Metallurgical Coal <sup>1</sup> .....	0.81	0.84	0.76	0.67	0.85	0.74	0.61	0.85	0.72	0.55
Steam Coal .....	1.73	1.91	1.85	1.84	1.94	1.87	1.83	1.99	1.90	1.84
Coal Subtotal .....	2.54	2.75	2.62	2.51	2.79	2.61	2.44	2.84	2.62	2.39
Renewable Energy .....	2.15	2.60	2.64	2.89	2.79	2.86	3.25	2.97	3.08	3.64
Electricity .....	3.63	4.35	4.18	4.06	4.71	4.47	4.28	5.15	4.81	4.55
<b>Delivered Energy</b> .....	<b>27.15</b>	<b>31.93</b>	<b>31.10</b>	<b>30.81</b>	<b>33.98</b>	<b>32.84</b>	<b>32.37</b>	<b>36.09</b>	<b>34.63</b>	<b>34.01</b>
Electricity Related Losses	7.87	8.64	8.32	8.08	8.94	8.48	8.12	9.36	8.76	8.28
<b>Total</b> .....	<b>35.02</b>	<b>40.57</b>	<b>39.42</b>	<b>38.88</b>	<b>42.92</b>	<b>41.31</b>	<b>40.49</b>	<b>45.46</b>	<b>43.39</b>	<b>42.29</b>
<b>Delivered Energy Use per Dollar of Output (thousand Btu per 1992 dollar)</b> .....										
	5.75	5.11	4.98	4.93	4.79	4.63	4.56	4.46	4.28	4.20

<sup>1</sup>Includes net coal coke imports.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports. Side cases were run without the fully integrated modeling system, so not all potential feedbacks were captured. The reference case ratio of electricity losses to electricity use was used to compute electricity losses for the technology cases.

**Source:** Energy Information Administration, AEO2001 National Energy Modeling System runs INDFRZTECH.D101700A, AEO2001.D101600A, and INDHITECH.D101700A.

## Results from Side Cases

**Table F4. Key Results for Transportation Sector Technology Cases**

Consumption and Indicators	1999	2010			2015			2020		
		2001 Technology	Reference Case	High Technology	2001 Technology	Reference Case	High Technology	2001 Technology	Reference Case	High Technology
<b>Energy Consumption (quadrillion Btu)</b>										
Distillate Fuel .....	5.13	7.21	6.99	6.59	8.11	7.60	6.94	9.07	8.21	7.35
Jet Fuel .....	3.46	4.56	4.51	4.51	5.35	5.22	5.14	6.23	5.97	5.80
Motor Gasoline .....	15.92	19.49	19.04	17.87	21.13	20.23	18.13	22.67	21.32	18.36
Residual Fuel .....	0.74	0.87	0.85	0.85	0.88	0.86	0.85	0.89	0.87	0.85
Liquefied Petroleum Gas .....	0.02	0.04	0.04	0.09	0.05	0.05	0.11	0.06	0.06	0.14
Other Petroleum .....	0.26	0.31	0.31	0.31	0.33	0.33	0.33	0.35	0.35	0.35
Petroleum Subtotal .....	25.54	32.48	31.74	30.21	35.84	34.28	31.51	39.28	36.77	32.85
Pipeline Fuel Natural Gas .....	0.66	0.90	0.90	0.90	0.99	0.99	0.99	1.09	1.09	1.09
Compressed Natural Gas .....	0.02	0.10	0.09	0.14	0.14	0.13	0.19	0.17	0.16	0.23
Renewables (E85) .....	0.01	0.03	0.03	0.05	0.04	0.04	0.06	0.05	0.04	0.07
Methanol (M85) .....	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01
Liquid Hydrogen .....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity .....	0.06	0.13	0.12	0.09	0.17	0.15	0.11	0.19	0.17	0.12
<b>Delivered Energy</b> .....	<b>26.28</b>	<b>33.64</b>	<b>32.89</b>	<b>31.39</b>	<b>37.19</b>	<b>35.60</b>	<b>32.87</b>	<b>40.78</b>	<b>38.23</b>	<b>34.36</b>
Electricity Related Losses .....	0.13	0.25	0.23	0.18	0.31	0.28	0.21	0.35	0.30	0.22
<b>Total</b> .....	<b>26.41</b>	<b>33.89</b>	<b>33.12</b>	<b>31.57</b>	<b>37.50</b>	<b>35.87</b>	<b>33.08</b>	<b>41.13</b>	<b>38.54</b>	<b>34.59</b>
<b>Energy Efficiency Indicators</b>										
New Light-Duty Vehicle (miles per gallon) <sup>1</sup> ..	24.2	25.3	27.1	31.9	25.3	27.6	33.8	25.3	28.0	35.0
New Car (miles per gallon) <sup>1</sup> .....	27.9	29.6	32.3	36.3	29.6	32.4	38.0	29.7	32.5	39.2
New Light Truck (miles per gallon) <sup>1</sup> .....	20.8	22.0	23.2	28.4	22.1	24.0	30.3	22.1	24.7	31.5
Light-Duty Fleet (miles per gallon) <sup>2</sup> .....	20.5	20.4	20.9	22.3	20.3	21.2	23.7	20.1	21.5	25.1
New Commercial Light Truck (MPG) <sup>3</sup> .....	20.1	20.9	22.0	26.8	20.8	22.8	28.4	20.8	23.4	29.5
Stock Commercial Light Truck (MPG) <sup>3</sup> .....	14.8	15.8	16.1	17.2	16.0	16.6	18.5	16.1	17.0	19.6
Aircraft Efficiency (seat miles per gallon) .....	51.7	55.4	56.1	56.2	56.6	58.2	59.1	57.5	60.3	62.2
Freight Truck Efficiency (miles per gallon) .....	6.0	6.3	6.4	6.7	6.3	6.7	7.1	6.4	6.9	7.5
Rail Efficiency (ton miles per thousand Btu) .....	2.8	2.8	3.1	3.3	2.8	3.3	3.5	2.8	3.4	3.8
Domestic Shipping Efficiency (ton miles per thousand Btu) .....	2.3	2.3	2.7	2.7	2.3	2.8	3.0	2.3	3.0	3.2
<b>Light-Duty Vehicles Less Than 8500 Pounds (vehicle miles traveled)</b> .....	<b>2394</b>	<b>3064</b>	<b>3066</b>	<b>3074</b>	<b>3328</b>	<b>3334</b>	<b>3347</b>	<b>3568</b>	<b>3577</b>	<b>3596</b>

<sup>1</sup>Environmental Protection Agency rated miles per gallon.

<sup>2</sup>Combined car and light truck "on-the-road" estimate.

<sup>3</sup>Commercial trucks 8,500 to 10,000 pounds.

Btu = British thermal unit.

MPG = Miles per gallon.

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports. Side cases were run without the fully integrated modeling system, so not all potential feedbacks were captured. The reference case ratio of electricity losses to electricity use was used to compute electricity losses for the technology cases.

Source: Energy Information Administration, AEO2001 National Energy Modeling System runs FRZ.D101700A, AEO2001.D101600A, and TEK.D101700A

## Results from Side Cases

**Table F5. Key Results for Integrated Technology Cases**

Consumption and Emissions	1999	2010			2015			2020		
		2001 Technology	Reference Case	High Technology	2001 Technology	Reference Case	High Technology	2001 Technology	Reference Case	High Technology
<b>Consumption by Sector (quadrillion Btu)</b>										
Residential .....	19.10	22.71	22.30	21.75	23.89	23.27	22.24	25.13	24.36	22.83
Commercial .....	15.61	19.53	19.30	19.16	20.66	20.29	19.80	21.28	20.75	19.95
Industrial .....	35.02	40.84	39.42	38.75	43.20	41.31	40.12	45.79	43.39	41.56
Transportation .....	26.41	33.93	33.12	31.58	37.54	35.87	33.07	41.12	38.54	34.61
<b>Total .....</b>	<b>96.14</b>	<b>117.00</b>	<b>114.14</b>	<b>111.24</b>	<b>125.28</b>	<b>120.75</b>	<b>115.23</b>	<b>133.31</b>	<b>127.04</b>	<b>118.94</b>
<b>Consumption by Fuel (quadrillion Btu)</b>										
Petroleum Products .....	38.03	45.52	44.41	42.60	49.52	47.50	44.24	53.68	50.59	45.96
Natural Gas .....	21.95	29.37	28.75	27.52	33.56	32.39	30.74	36.84	35.57	33.15
Coal .....	21.43	26.26	25.15	24.23	26.85	25.68	24.56	27.76	26.20	24.53
Nuclear Power .....	7.79	7.69	7.69	7.67	6.94	6.82	6.13	6.31	6.13	5.18
Renewable Energy .....	6.59	7.86	7.83	8.90	8.18	8.13	9.33	8.49	8.31	9.88
Other .....	0.34	0.31	0.31	0.31	0.23	0.23	0.23	0.23	0.23	0.23
<b>Total .....</b>	<b>96.14</b>	<b>117.00</b>	<b>114.14</b>	<b>111.24</b>	<b>125.28</b>	<b>120.75</b>	<b>115.23</b>	<b>133.31</b>	<b>127.04</b>	<b>118.94</b>
<b>Energy Intensity (thousand Btu per 1996 dollar of GDP) ..</b>										
	10.84	9.24	9.02	8.78	8.57	8.25	7.87	8.09	7.70	7.19
<b>Carbon Dioxide Emissions by Sector (million metric tons carbon equivalent)</b>										
Residential .....	289.3	355.3	345.9	330.9	377.9	366.2	347.3	402.0	388.1	360.0
Commercial .....	242.9	311.7	305.3	296.0	333.9	326.3	315.0	348.4	338.2	320.8
Industrial .....	480.4	555.5	529.4	508.6	588.5	555.2	526.3	626.0	583.6	540.4
Transportation .....	498.2	643.8	628.5	598.7	712.1	680.5	626.4	780.1	730.8	653.8
<b>Total .....</b>	<b>1,510.8</b>	<b>1,866.3</b>	<b>1,809.1</b>	<b>1,734.3</b>	<b>2,012.5</b>	<b>1,928.1</b>	<b>1,815.1</b>	<b>2,156.6</b>	<b>2,040.7</b>	<b>1,875.0</b>
<b>Carbon Dioxide Emissions by End-Use Fuel (million metric tons carbon equivalent)</b>										
Petroleum .....	629.7	769.8	750.6	717.1	840.3	803.7	743.1	912.0	856.1	769.8
Natural Gas .....	266.0	315.9	309.8	302.2	335.6	327.5	316.7	350.7	343.3	330.0
Coal .....	58.8	73.0	69.5	66.4	74.2	69.4	64.8	75.7	69.6	63.3
Other .....	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Electricity .....	556.3	707.5	679.1	648.5	762.3	727.5	690.4	818.0	771.5	711.8
<b>Total .....</b>	<b>1,510.8</b>	<b>1,866.3</b>	<b>1,809.1</b>	<b>1,734.3</b>	<b>2,012.5</b>	<b>1,928.1</b>	<b>1,815.1</b>	<b>2,156.6</b>	<b>2,040.7</b>	<b>1,875.0</b>
<b>Carbon Dioxide Emissions by Electric Generators (million metric tons carbon equivalent)</b>										
Petroleum .....	20.0	4.0	3.4	3.2	3.8	3.4	3.3	5.3	3.7	2.8
Natural Gas .....	45.8	104.7	101.8	91.8	145.2	136.5	123.4	176.9	166.3	144.3
Coal .....	490.5	598.9	574.0	553.5	613.4	587.6	563.7	635.8	601.5	564.6
<b>Total .....</b>	<b>556.3</b>	<b>707.5</b>	<b>679.1</b>	<b>648.5</b>	<b>762.3</b>	<b>727.5</b>	<b>690.4</b>	<b>818.0</b>	<b>771.5</b>	<b>711.8</b>
<b>Carbon Dioxide Emissions by Primary Fuel (million metric tons carbon equivalent)</b>										
Petroleum .....	649.7	773.8	754.0	720.3	844.1	807.1	746.3	917.3	859.9	772.7
Natural Gas .....	311.8	420.5	411.5	393.9	480.8	463.9	440.2	527.7	509.6	474.3
Coal .....	549.3	671.9	643.5	619.9	687.6	657.0	628.5	711.5	671.1	627.9
Other .....	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<b>Total .....</b>	<b>1,510.8</b>	<b>1,866.3</b>	<b>1,809.1</b>	<b>1,734.3</b>	<b>2,012.5</b>	<b>1,928.1</b>	<b>1,815.1</b>	<b>2,156.6</b>	<b>2,040.7</b>	<b>1,875.0</b>

Btu = British thermal unit.

GDP = Gross domestic product.

Note: Includes end-use, fossil electricity, and renewable technology assumptions. Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports.

Source: Energy Information Administration, AEO2001 National Energy Modeling System runs LTRKITEN.D101800A, AEO2001.D101600A, and HTRKITEN.D101800A.

## Results from Side Cases

**Table F6. Key Results for Nuclear Generation Cases**  
(Gigawatts, Unless Otherwise Noted)

Net Summer Capability, Generation, Emissions, and Fuel Prices	1999	Projections							
		2010				2020			
		Reference	Low Nuclear	High Nuclear	Nuclear Penetration	Reference	Low Nuclear	High Nuclear	Nuclear Penetration
<b>Capability</b>									
Coal Steam .....	306.0	315.0	314.5	314.5	314.7	316.4	316.6	314.1	315.2
Other Fossil Steam .....	138.2	120.4	120.2	120.3	120.2	116.1	116.0	116.1	116.0
Combined Cycle .....	20.2	126.0	127.3	124.0	125.8	229.1	241.9	217.9	230.8
Combustion Turbine/Diesel .....	75.2	164.1	165.7	165.2	163.7	210.7	215.0	210.1	209.3
Nuclear Power .....	97.4	93.7	89.9	96.9	93.7	71.6	55.3	88.5	72.0
Pumped Storage .....	19.3	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5
Fuel Cells .....	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3
Renewable Sources .....	88.1	95.4	95.4	95.4	95.4	97.0	97.0	97.0	97.0
Distributed Generation .....	0.0	6.0	5.9	6.0	6.0	12.7	12.8	13.1	12.9
Cogenerators/Other Generators <sup>1</sup> .....	52.6	64.5	64.5	64.5	64.5	72.2	72.2	72.2	72.2
<b>Total</b> .....	<b>797.2</b>	<b>1004.8</b>	<b>1003.1</b>	<b>1006.4</b>	<b>1003.7</b>	<b>1145.6</b>	<b>1146.6</b>	<b>1148.8</b>	<b>1145.2</b>
<b>Cumulative Additions</b>									
Coal Steam .....	0.0	18.5	18.3	18.2	18.5	21.8	22.4	19.7	20.9
Other Fossil Steam .....	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Combined Cycle .....	0.0	105.8	107.1	103.8	105.5	208.9	221.6	197.7	210.6
Combustion Turbine/Diesel .....	0.0	93.8	95.2	94.7	93.2	141.2	145.4	140.4	139.6
Nuclear Power .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Pumped Storage .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fuel Cells .....	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3
Renewable Sources .....	0.0	6.9	6.9	6.9	6.9	8.5	8.5	8.5	8.5
Distributed Generation .....	0.0	6.0	5.9	6.0	6.0	12.7	12.8	13.1	12.9
Cogenerators/Other Generators <sup>1</sup> .....	0.0	11.9	11.9	11.9	11.9	19.6	19.6	19.6	19.6
<b>Total</b> .....	<b>0.0</b>	<b>243.2</b>	<b>245.5</b>	<b>241.7</b>	<b>242.2</b>	<b>413.0</b>	<b>430.7</b>	<b>399.3</b>	<b>412.8</b>
<b>Cumulative Retirements</b> .....	<b>0.0</b>	<b>40.3</b>	<b>44.7</b>	<b>37.5</b>	<b>40.8</b>	<b>69.4</b>	<b>86.3</b>	<b>52.8</b>	<b>69.8</b>
<b>Generation by Fuel (billion kilowatthours)</b>									
Coal .....	1833	2196	2200	2189	2195	2298	2321	2266	2292
Petroleum .....	100	17	17	17	17	19	21	17	19
Natural Gas .....	371	900	911	886	900	1587	1686	1506	1589
Nuclear Power .....	730	720	706	741	720	574	450	688	578
Pumped Power .....	-1	-1	-1	-1	-1	-1	-1	-1	-1
Renewable Sources .....	353	390	389	390	390	396	396	396	396
Distributed Generation .....	0	3	3	3	3	6	6	6	6
Cogenerators/Other Generators <sup>1</sup> .....	307	375	375	375	375	427	427	427	427
<b>Total</b> .....	<b>3693</b>	<b>4599</b>	<b>4599</b>	<b>4599</b>	<b>4599</b>	<b>5305</b>	<b>5306</b>	<b>5305</b>	<b>5305</b>
<b>Carbon Dioxide Emissions by Electric Generators (million metric tons carbon equivalent)<sup>2</sup></b>									
Petroleum .....	20.0	3.4	3.5	3.4	3.5	3.7	4.2	3.5	3.8
Natural Gas .....	45.8	101.8	103.1	100.5	102.0	166.3	175.4	158.8	166.3
Coal .....	490.5	574.0	575.1	572.1	573.8	601.5	608.0	593.6	600.5
<b>Total</b> .....	<b>556.3</b>	<b>679.1</b>	<b>681.6</b>	<b>676.0</b>	<b>679.3</b>	<b>771.5</b>	<b>787.6</b>	<b>755.9</b>	<b>770.5</b>
<b>Prices to Electric Generators (1999 dollars per million Btu)</b>									
Petroleum .....	2.50	4.11	4.10	4.11	4.10	4.35	4.25	4.42	4.34
Natural Gas .....	2.55	3.03	3.05	3.02	3.03	3.59	3.89	3.39	3.59
Coal .....	1.21	1.05	1.05	1.05	1.05	0.98	0.99	0.98	0.98

<sup>1</sup> Includes small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid. Excludes off-grid photovoltaics and other generators not connected to the distribution or transmission systems.

<sup>2</sup> Excludes cogenerators and other generators

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports. Net summer capability has been estimated for nonutility generators to be consistent with electric utility capability estimates. Side cases were run without the fully integrated modeling system, so not all potential feedbacks were captured.

**Source:** Energy Information Administration, AEO2001 National Energy Modeling System runs AEO2001.D101600A, LNUC01.D101700C, HNUC01.D101700B, and ADVNUC1.D101700A.

## Results from Side Cases

**Table F7. Key Results for Electricity Demand Case**

Net Summer Capability, Generation, Consumption, Emissions, and Prices	1999	2005		2010		2020		Annual Growth 1999-2020	
		Reference Case	High Demand	Reference Case	High Demand	Reference Case	High Demand	Reference Case	High Demand
<b>Electricity Sales (billion kilowatthours) . . .</b>	3309	3,761	3,892	4,147	4,442	4,804	5,514	1.8%	2.5%
<b>Electricity Prices (1999 cents per kilowatthour) . . . . .</b>	6.7	6.2	6.3	5.9	6.0	6.0	6.4	-0.5%	-0.2%
<b>Capability (gigawatts)</b>									
Coal Steam . . . . .	306.0	300.9	301.0	315.0	332.0	316.4	385.0	0.2%	1.1%
Other Fossil Steam . . . . .	138.2	128.5	128.3	120.4	119.8	116.1	117.6	-0.8%	-0.8%
Combined Cycle . . . . .	20.2	49.5	51.4	126.0	146.6	229.1	275.5	12.2%	13.2%
Combustion Turbine/Diesel . . . . .	75.2	130.6	139.9	164.1	193.3	210.7	258.4	5.0%	6.1%
Nuclear Power . . . . .	97.4	97.5	97.5	93.7	93.7	71.6	73.8	-1.5%	-1.3%
Fuel Cells . . . . .	0.0	0.0	0.0	0.1	0.1	0.3	0.3	34.2%	34.2%
Renewable Sources/Pumped Storage . . . . .	107.4	111.6	111.8	114.9	115.2	116.5	117.0	0.4%	0.4%
Distributed Generation . . . . .	0.0	2.0	2.2	6.0	7.8	12.7	20.0	N/A	N/A
Cogenerators/Other Generators <sup>1</sup> . . . . .	52.6	60.3	60.3	64.5	64.5	72.2	72.2	1.5%	1.5%
<b>Total . . . . .</b>	<b>797.2</b>	<b>880.9</b>	<b>892.4</b>	<b>1,004.8</b>	<b>1,073.1</b>	<b>1,145.6</b>	<b>1,319.9</b>	<b>1.7%</b>	<b>2.4%</b>
<b>Cumulative Additions (gigawatts)</b>									
Coal Steam . . . . .	0.0	2.4	2.8	18.5	35.8	21.8	90.7	N/A	N/A
Other Fossil Steam . . . . .	0.0	0.1	0.1	0.1	0.1	0.1	0.1	N/A	N/A
Combined Cycle . . . . .	0.0	29.3	31.2	105.8	126.4	208.9	255.3	N/A	N/A
Combustion Turbine/Diesel . . . . .	0.0	59.0	68.1	93.8	122.6	141.2	188.7	N/A	N/A
Nuclear Power . . . . .	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N/A	N/A
Fuel Cells . . . . .	0.0	0.0	0.0	0.1	0.1	0.3	0.3	N/A	N/A
Renewable Sources/Pumped Storage . . . . .	0.0	3.7	3.8	6.9	7.2	8.5	8.9	N/A	N/A
Distributed Generation . . . . .	0.0	2.0	2.2	6.0	7.8	12.7	20.0	N/A	N/A
Cogenerators/Other Generators <sup>1</sup> . . . . .	0.0	7.7	7.7	11.9	11.9	19.6	19.6	N/A	N/A
<b>Total . . . . .</b>	<b>0.0</b>	<b>104.1</b>	<b>115.9</b>	<b>243.2</b>	<b>311.8</b>	<b>413.0</b>	<b>583.6</b>	<b>N/A</b>	<b>N/A</b>
<b>Generation by Fuel (billion kilowatthours)</b>									
Coal . . . . .	1833	2,085	2,128	2,196	2,372	2,298	2,833	1.1%	2.1%
Petroleum . . . . .	100	32	43	17	22	19	31	-7.7%	-5.4%
Natural Gas . . . . .	371	584	670	900	1,032	1,587	1,767	7.2%	7.7%
Nuclear Power . . . . .	730	740	740	720	720	574	591	-1.1%	-1.0%
Renewable Sources/Pumped Storage . . . . .	352	369	369	389	391	395	398	0.5%	0.6%
Distributed Generation . . . . .	0	1	1	3	3	6	9	N/A	N/A
Cogenerators/Other Generators <sup>1</sup> . . . . .	307	352	352	375	374	427	426	1.6%	1.6%
<b>Total . . . . .</b>	<b>3693</b>	<b>4,163</b>	<b>4,304</b>	<b>4,599</b>	<b>4,914</b>	<b>5,305</b>	<b>6,054</b>	<b>1.7%</b>	<b>2.4%</b>
<b>Fossil Fuel Consumption by Electric Generators (quadrillion Btu)<sup>2</sup></b>									
Petroleum . . . . .	1.08	0.32	0.44	0.16	0.21	0.18	0.29	-8.2%	-6.0%
Natural Gas . . . . .	3.85	5.45	6.27	7.07	8.01	11.55	12.63	5.4%	5.8%
Coal . . . . .	18.78	21.40	21.89	22.41	24.03	23.46	27.55	1.1%	1.8%
<b>Carbon Dioxide Emissions by Electric Generators (million metric tons carbon equivalent)<sup>2</sup></b>									
Petroleum . . . . .	20.0	6.7	9.3	3.4	4.4	3.7	6.1	-7.7%	-5.5%
Natural Gas . . . . .	45.8	78.5	90.4	101.8	115.3	166.3	181.8	6.3%	6.8%
Coal . . . . .	490.5	547.9	560.4	574.0	615.6	601.5	707.0	1.0%	1.8%
<b>Total . . . . .</b>	<b>556.3</b>	<b>633.1</b>	<b>660.0</b>	<b>679.1</b>	<b>735.3</b>	<b>771.5</b>	<b>894.9</b>	<b>1.6%</b>	<b>2.3%</b>
<b>Prices to Electric Generators (1999 dollars per million Btu)</b>									
Petroleum . . . . .	2.50	3.70	3.64	4.11	3.98	4.35	4.33	2.7%	2.6%
Natural Gas . . . . .	2.55	2.88	3.11	3.03	3.35	3.59	4.29	1.6%	2.5%
Coal . . . . .	1.21	1.13	1.14	1.05	1.06	0.98	0.99	-1.0%	-0.9%

<sup>1</sup> Includes small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid. Excludes off-grid photovoltaics and other generators not connected to the distribution or transmission systems.

<sup>2</sup> Excludes cogenerators and other generators

Btu = British thermal unit.

N/A = not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports. Other includes non-coal fossil steam, pumped storage, methane, propane and blast furnace gas. Side case was run without the fully integrated modeling system, so not all potential feedbacks were captured.

Source: Energy Information Administration, AEO2001 National Energy Modeling System runs AEO2001.D101600A, and HDEM01.D101700A.

## Results from Side Cases

**Table F8. Key Results for Electricity Sector Fossil Technology Cases**  
(Gigawatts, Unless Otherwise Noted)

Net Summer Capability, Generation Consumption, and Emissions	1999	2005			2010			2020		
		Low Fossil	Reference Case	High Fossil	Low Fossil	Reference Case	High Fossil	Low Fossil	Reference Case	High Fossil
<b>Capability</b>										
Pulverized Coal .....	305.5	299.5	299.8	299.6	316.5	311.3	302.7	318.7	310.4	298.9
Coal Gasification Combined-Cycle .....	0.5	0.8	1.1	1.4	2.2	3.7	17.5	2.2	6.0	27.3
Conventional Natural Gas Combined-Cycle ..	20.2	44.6	36.3	32.3	108.2	69.0	39.1	220.2	87.2	39.1
Advanced Natural Gas Combined-Cycle .....	0.0	5.0	13.2	15.8	12.6	57.0	71.7	12.6	141.8	186.3
Conventional Combustion Turbine .....	75.2	131.5	127.0	123.6	165.7	152.3	148.5	198.5	184.4	171.3
Advanced Combustion Turbine .....	0.0	1.1	3.6	9.2	3.1	11.8	26.8	3.1	26.3	53.8
Fuel Cells .....	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.3
Nuclear .....	97.4	97.5	97.5	97.5	93.7	93.7	93.0	73.1	71.6	59.7
Oil and Gas Steam .....	138.2	128.3	128.5	128.3	119.8	120.4	120.2	115.6	116.1	115.2
Renewable Sources/Pumped Storage .....	107.4	111.6	111.6	111.5	115.3	114.9	114.4	117.4	116.5	115.9
Distributed Generation .....	0.0	2.3	2.0	1.7	7.0	6.0	4.9	13.3	12.7	10.2
Cogenerators/Other Generators <sup>1</sup> .....	52.6	60.3	60.3	60.3	64.5	64.5	64.5	72.2	72.2	72.2
<b>Total</b> .....	<b>797.2</b>	<b>882.6</b>	<b>880.9</b>	<b>881.3</b>	<b>1008.8</b>	<b>1004.8</b>	<b>1003.7</b>	<b>1147.1</b>	<b>1145.6</b>	<b>1150.1</b>
<b>Cumulative Additions</b>										
Pulverized Coal .....	0.0	1.9	1.9	1.9	20.8	15.3	7.0	24.8	16.4	7.0
Coal Gasification Combined-Cycle .....	0.0	0.3	0.5	0.9	1.7	3.2	17.0	1.7	5.5	26.7
Conventional Natural Gas Combined-Cycle ..	0.0	24.3	16.0	12.1	88.0	48.8	18.9	200.0	67.0	18.9
Advanced Natural Gas Combined-Cycle .....	0.0	5.0	13.2	15.8	12.6	57.0	71.7	12.6	141.8	186.3
Conventional Combustion Turbine .....	0.0	59.7	55.4	51.9	95.3	82.1	78.1	129.0	114.9	101.6
Advanced Combustion Turbine .....	0.0	1.1	3.6	9.2	3.1	11.8	26.8	3.1	26.3	53.8
Fuel Cells .....	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.3
Nuclear .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil and Gas Steam .....	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Renewable Sources .....	0.0	3.7	3.7	3.6	7.3	6.9	6.4	9.4	8.5	7.9
Distributed Generation .....	0.0	2.3	2.0	1.7	7.0	6.0	4.9	13.3	12.7	10.2
Cogenerators/Other Generators <sup>1</sup> .....	0.0	7.7	7.7	7.7	11.9	11.9	11.9	19.6	19.6	19.6
<b>Total</b> .....	<b>0.0</b>	<b>106.1</b>	<b>104.1</b>	<b>104.8</b>	<b>247.8</b>	<b>243.2</b>	<b>242.9</b>	<b>413.7</b>	<b>413.0</b>	<b>432.3</b>
<b>Cumulative Retirements</b> .....										
<b>Total</b> .....	<b>0.0</b>	<b>25.6</b>	<b>25.1</b>	<b>25.6</b>	<b>41.2</b>	<b>40.3</b>	<b>41.6</b>	<b>68.9</b>	<b>69.4</b>	<b>84.5</b>
<b>Generation by Fuel (billion kilowatthours)</b>										
Coal .....	1833	2088	2085	2082	2242	2196	2199	2346	2298	2305
Petroleum .....	100	32	32	31	18	17	17	20	19	15
Natural Gas .....	371	581	584	590	850	900	905	1519	1587	1672
Nuclear Power .....	730	740	740	740	720	720	718	586	574	491
Renewable Sources/Pumped Storage .....	353	369	369	367	392	389	385	401	395	391
Distributed Generation .....	0	1	1	1	3	3	2	6	6	5
Cogenerators/Other Generators <sup>1</sup> .....	307	352	352	351	375	375	374	427	427	426
<b>Total</b> .....	<b>3693</b>	<b>4163</b>	<b>4163</b>	<b>4163</b>	<b>4600</b>	<b>4599</b>	<b>4600</b>	<b>5306</b>	<b>5305</b>	<b>5305</b>
<b>Fuel Consumption by Electric Generators (quadrillion Btu)<sup>2</sup></b>										
Coal .....	18.78	21.45	21.40	21.36	22.89	22.41	22.16	23.99	23.46	22.96
Petroleum .....	1.08	0.32	0.32	0.31	0.17	0.16	0.16	0.19	0.18	0.15
Natural Gas .....	3.85	5.52	5.45	5.39	7.03	7.07	6.79	11.73	11.55	10.53
Nuclear Power .....	7.79	7.90	7.90	7.90	7.69	7.69	7.67	6.26	6.13	5.25
Renewable Sources .....	3.94	4.19	4.19	4.17	4.68	4.64	4.48	4.84	4.66	4.55
<b>Total</b> .....	<b>35.44</b>	<b>39.38</b>	<b>39.26</b>	<b>39.13</b>	<b>42.47</b>	<b>41.98</b>	<b>41.26</b>	<b>47.01</b>	<b>45.98</b>	<b>43.43</b>
<b>Carbon Dioxide Emissions by Electric Generators (million metric tons carbon equivalent)<sup>2</sup></b>										
Petroleum .....	20.0	6.8	6.7	6.6	3.5	3.4	3.3	3.9	3.7	3.0
Natural Gas .....	45.8	79.4	78.5	77.6	101.3	101.8	97.8	168.9	166.3	151.6
Coal .....	490.5	549.0	547.9	546.9	586.3	574.0	567.6	615.4	601.5	588.5
<b>Total</b> .....	<b>556.3</b>	<b>635.2</b>	<b>633.1</b>	<b>631.0</b>	<b>691.0</b>	<b>679.1</b>	<b>668.7</b>	<b>788.3</b>	<b>771.5</b>	<b>743.2</b>

<sup>1</sup> Includes small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid. Excludes off-grid photovoltaics and other generators not connected to the distribution or transmission systems.

<sup>2</sup> Excludes cogenerators and other generators.

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports. Net summer capability has been estimated for nonutility generators to be consistent with electric utility capability estimates. Side cases were run without the fully integrated modeling system, so not all potential feedbacks were captured.

Source: Energy Information Administration, AEO2001 National Energy Modeling System runs LFOSS01.D101700A, AEO2001.D101600A, and HFOSS01.D101800B.

## Results from Side Cases

**Table F9. Key Results for High Renewable Energy Case**

Capacity, Generation, and Emissions	1999	2010		2020		
		Reference	High Renewables	Reference	High Renewables	
<b>Renewable Capability (Gigawatts)</b>						
<b>Net Summer Capability</b>						
<b>Electric Generators<sup>1</sup></b>						
Conventional Hydropower .....	78.14	78.74	78.74	78.74	78.74	
Geothermal <sup>2</sup> .....	2.87	4.34	8.81	4.41	9.56	
Municipal Solid Waste <sup>3</sup> .....	2.59	4.20	4.49	4.72	5.02	
Wood and Other Biomass <sup>4</sup> .....	1.52	2.04	2.04	2.37	3.22	
Solar Thermal .....	0.33	0.40	0.40	0.48	0.48	
Solar Photovoltaic .....	0.01	0.21	0.21	0.54	0.54	
Wind .....	2.60	5.51	7.13	5.78	18.97	
<b>Total</b> .....	<b>88.07</b>	<b>95.44</b>	<b>101.81</b>	<b>97.04</b>	<b>116.52</b>	
<b>Cogenerators<sup>5</sup></b>						
Municipal Solid Waste .....	0.70	0.70	0.70	0.70	0.70	
Wood and Other Biomass .....	4.65	6.06	6.06	7.54	7.54	
<b>Total</b> .....	<b>5.35</b>	<b>6.76</b>	<b>6.76</b>	<b>8.23</b>	<b>8.23</b>	
<b>Other End-Use Generators<sup>6</sup></b>						
Conventional Hydropower .....	0.99	0.99	0.99	0.99	0.99	
Geothermal .....	0.00	0.00	0.00	0.00	0.00	
Solar Photovoltaic .....	0.01	0.35	0.35	0.35	0.89	
<b>Total</b> .....	<b>1.00</b>	<b>1.34</b>	<b>1.34</b>	<b>1.34</b>	<b>1.88</b>	
<b>Generation (billion kilowatthours)</b>						
<b>Electric Generators</b>						
Coal .....	1833	2196	2176	2298	2268	
Petroleum .....	100	17	17	19	18	
Natural Gas .....	371	900	877	1587	1532	
<b>Total Fossil</b> .....	<b>2304</b>	<b>3112</b>	<b>3070</b>	<b>3903</b>	<b>3818</b>	
Conventional Hydropower .....	307.43	298.99	298.99	297.94	297.95	
Geothermal .....	13.07	25.27	60.48	25.83	66.38	
Municipal Solid Waste <sup>3</sup> .....	18.05	30.00	32.29	33.96	36.37	
Wood and Other Biomass <sup>4</sup> .....	9.49	21.59	23.63	22.15	22.93	
Dedicated Plants .....	7.56	10.88	10.88	13.35	18.97	
Cofiring .....	1.93	10.71	12.75	8.80	3.95	
Solar Thermal .....	0.89	1.11	1.11	1.37	1.37	
Solar Photovoltaic .....	0.03	0.51	0.51	1.36	1.36	
Wind .....	4.46	12.33	18.44	13.10	64.17	
<b>Total Renewable</b> .....	<b>353.42</b>	<b>389.80</b>	<b>435.45</b>	<b>395.71</b>	<b>490.52</b>	
<b>Cogenerators<sup>5</sup></b>						
Coal .....	47	52	52	52	52	
Petroleum .....	9	10	10	10	10	
Natural Gas .....	206	257	256	299	298	
<b>Total Fossil</b> .....	<b>262</b>	<b>319</b>	<b>318</b>	<b>361</b>	<b>360</b>	
Municipal Solid Waste .....	4.03	4.03	4.03	4.03	4.03	
Wood and Other Biomass .....	27.08	35.01	35.01	43.52	43.52	
<b>Total Renewables</b> .....	<b>31.11</b>	<b>39.03</b>	<b>39.03</b>	<b>47.55</b>	<b>47.55</b>	
<b>Other End-Use Generators<sup>6</sup></b>						
Conventional Hydropower <sup>7</sup> .....	4.57	4.43	4.43	4.41	4.41	
Geothermal .....	0.00	0.00	0.00	0.00	0.00	
Solar Photovoltaic .....	0.02	0.75	0.76	0.75	1.91	
<b>Total</b> .....	<b>4.59</b>	<b>5.18</b>	<b>5.19</b>	<b>5.17</b>	<b>6.32</b>	
<b>Carbon Dioxide Emissions by Electric Generators (million metric tons carbon equivalent)<sup>8</sup></b>						
Petroleum .....	20.0	3.4	3.3	3.7	3.6	
Natural Gas .....	45.8	101.8	99.2	166.3	159.6	
Coal .....	490.5	574.0	569.3	601.5	594.5	
<b>Total</b> .....	<b>556.3</b>	<b>679.1</b>	<b>671.8</b>	<b>771.5</b>	<b>757.6</b>	

<sup>1</sup>Includes grid-connected utilities and nonutilities other than cogenerators. These nonutility facilities include small power producers and exempt wholesale generators.

<sup>2</sup>Includes hydrothermal resources only (hot water and steam).

<sup>3</sup>Includes landfill gas.

<sup>4</sup>Includes projections for energy crops after 2010.

<sup>5</sup>Cogenerators produce electricity and other useful thermal energy.

<sup>6</sup>Includes small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid. Excludes off-grid photovoltaics and other generators not connected to the distribution or transmission systems.

<sup>7</sup>Represents own-use industrial hydroelectric power.

<sup>8</sup>Excludes cogenerators and other generators.

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports. Side case was run without the fully integrated modeling system, so not all potential feedbacks were captured.

Source: Energy Information Administration, AEO2001 National Energy Modeling System runs AEO2001.D101600A, and HIRENEW.D101800A.

## Results from Side Cases

**Table F10. Total Energy Supply and Disposition Summary, Oil and Gas Technological Progress Cases**  
 (Quadrillion Btu per Year, Unless Otherwise Noted)

Supply, Disposition, and Prices	1999	Projections									
		2010				2015				2020	
		Slow Technology Progress	Reference	Rapid Technology Progress	Slow Technology Progress	Reference	Rapid Technology Progress	Slow Technology Progress	Reference	Rapid Technology Progress	
<b>Production</b>											
Crude Oil and Lease Condensate . . .	12.45	10.31	10.90	11.42	9.95	10.76	11.44	9.79	10.69	11.41	
Natural Gas Plant Liquids . . . . .	2.62	3.27	3.33	3.37	3.61	3.73	3.80	3.83	4.10	4.25	
Dry Natural Gas . . . . .	19.16	23.35	23.74	24.01	26.11	26.92	27.47	27.82	29.79	30.92	
Coal . . . . .	23.09	26.36	26.06	25.88	26.85	26.42	26.06	27.60	26.95	26.28	
Nuclear Power . . . . .	7.79	7.69	7.69	7.69	6.82	6.82	6.82	6.20	6.13	6.05	
Renewable Energy <sup>1</sup> . . . . .	6.58	7.77	7.82	7.77	8.06	8.12	8.06	8.30	8.31	8.33	
Other <sup>2</sup> . . . . .	1.65	0.30	0.30	0.35	0.32	0.32	0.32	0.33	0.34	0.33	
<b>Total</b> . . . . .	<b>73.35</b>	<b>79.05</b>	<b>79.85</b>	<b>80.48</b>	<b>81.71</b>	<b>83.10</b>	<b>83.97</b>	<b>83.87</b>	<b>86.30</b>	<b>87.57</b>	
<b>Imports</b>											
Crude Oil <sup>3</sup> . . . . .	18.96	25.87	25.15	24.59	26.71	25.94	25.26	27.32	26.44	25.69	
Petroleum Products <sup>4</sup> . . . . .	4.14	6.50	6.49	6.44	8.78	8.46	8.32	11.67	10.69	10.46	
Natural Gas . . . . .	3.63	5.59	5.61	5.61	6.10	6.17	6.22	6.33	6.58	6.69	
Other Imports <sup>5</sup> . . . . .	0.62	0.89	0.89	0.89	0.88	0.88	0.88	0.94	0.94	0.94	
<b>Total</b> . . . . .	<b>27.35</b>	<b>38.85</b>	<b>38.14</b>	<b>37.53</b>	<b>42.46</b>	<b>41.44</b>	<b>40.67</b>	<b>46.26</b>	<b>44.64</b>	<b>43.77</b>	
<b>Exports</b>											
Petroleum <sup>6</sup> . . . . .	1.98	1.79	1.78	1.79	1.83	1.83	1.85	1.92	1.91	1.93	
Natural Gas . . . . .	0.17	0.43	0.43	0.43	0.53	0.53	0.53	0.63	0.63	0.63	
Coal . . . . .	1.48	1.45	1.46	1.45	1.35	1.35	1.35	1.41	1.41	1.41	
<b>Total</b> . . . . .	<b>3.62</b>	<b>3.68</b>	<b>3.67</b>	<b>3.67</b>	<b>3.71</b>	<b>3.72</b>	<b>3.73</b>	<b>3.96</b>	<b>3.95</b>	<b>3.97</b>	
<b>Consumption</b>											
Petroleum Products <sup>8</sup> . . . . .	38.03	44.48	44.41	44.38	47.63	47.50	47.45	51.20	50.59	50.47	
Natural Gas . . . . .	21.95	28.34	28.75	29.02	31.52	32.39	33.00	33.36	35.57	36.82	
Coal . . . . .	21.43	25.44	25.15	24.96	26.12	25.68	25.30	26.84	26.20	25.53	
Nuclear Power . . . . .	7.79	7.69	7.69	7.69	6.82	6.82	6.82	6.20	6.13	6.05	
Renewable Energy <sup>1</sup> . . . . .	6.59	7.78	7.83	7.77	8.07	8.13	8.06	8.31	8.31	8.34	
Other <sup>9</sup> . . . . .	0.34	0.31	0.31	0.31	0.23	0.23	0.23	0.23	0.23	0.23	
<b>Total</b> . . . . .	<b>96.14</b>	<b>114.05</b>	<b>114.14</b>	<b>114.13</b>	<b>120.38</b>	<b>120.75</b>	<b>120.87</b>	<b>126.15</b>	<b>127.03</b>	<b>127.43</b>	
<b>Net Imports - Petroleum</b> . . . . .	<b>21.12</b>	<b>30.57</b>	<b>29.86</b>	<b>29.24</b>	<b>33.65</b>	<b>32.57</b>	<b>31.73</b>	<b>37.07</b>	<b>35.22</b>	<b>34.21</b>	
<b>Prices (1999 dollars per unit)</b>											
World Oil Price (dollars per barrel) <sup>10</sup> ..	17.35	21.37	21.37	21.37	21.89	21.89	21.89	22.41	22.41	22.41	
Gas Wellhead Price (dollars per Mcf) <sup>11</sup>	2.08	2.92	2.69	2.54	3.32	2.83	2.54	4.23	3.13	2.50	
Coal Minemouth Price (dollars per ton)	16.98	13.95	13.83	13.73	13.18	13.38	13.26	12.71	12.70	12.77	
Average Electric Price (cents per Kwh)	6.7	6.0	5.9	5.8	6.1	5.9	5.8	6.5	6.0	5.7	
<b>Carbon Dioxide Emissions (million metric tons carbon equivalent)</b> .....	<b>1510.8</b>	<b>1812.0</b>	<b>1809.1</b>	<b>1807.5</b>	<b>1929.8</b>	<b>1928.1</b>	<b>1926.6</b>	<b>2037.7</b>	<b>2040.6</b>	<b>2039.1</b>	

<sup>1</sup>Includes grid-connected electricity from conventional hydroelectric; wood and wood waste; landfill gas; municipal solid waste; other biomass; wind; photovoltaic and solar thermal sources; non-electric energy from renewable sources, such as active and passive solar systems, and wood; and both the ethanol and gasoline components of E85, but not the ethanol components of blends less than 85 percent. Excludes electricity imports using renewable sources and nonmarketed renewable energy.

<sup>2</sup>Includes liquid hydrogen, methanol, supplemental natural gas, and some domestic inputs to refineries.

<sup>3</sup>Includes imports of crude oil for the Strategic Petroleum Reserve.

<sup>4</sup>Includes imports of finished petroleum products, imports of unfinished oils, alcohols, ethers, and blending components.

<sup>5</sup>Includes coal, coal coke (net), and electricity (net).

<sup>6</sup>Includes crude oil and petroleum products.

<sup>7</sup>Balancing item. Includes unaccounted for supply, losses, gains, and net storage withdrawals.

<sup>8</sup>Includes natural gas plant liquids, crude oil consumed as a fuel, and nonpetroleum based liquids for blending, such as ethanol.

<sup>9</sup>Includes net electricity imports, methanol, and liquid hydrogen.

<sup>10</sup>Average refiner acquisition cost for imported crude oil.

<sup>11</sup>Represents lower 48 onshore and offshore supplies.

Btu = British thermal unit.

Mcf = Thousand cubic feet.

Kwh = Kilowatthour.

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports.

**Sources:** 1999 natural gas values: Energy Information Administration (EIA), *Natural Gas Monthly*, DOE/EIA-0130(2000/06) (Washington, DC, June 2000). 1999 petroleum values: EIA, *Petroleum Supply Annual 1999*, DOE/EIA-0340(99/1) (Washington, DC, June 2000). Other 1999 values: EIA, *Annual Energy Review 1999*, DOE/EIA-0384(99) (Washington, DC, July 2000) and EIA, *Quarterly Coal Report*, DOE/EIA-0121(2000/1Q) (Washington, DC, August 2000). **Projections:** EIA, AEO2001 National Energy Modeling System runs OGLTEC.D101600A, AEO2001.D101600A, and OGHTEC.D101600A.

## Results from Side Cases

**Table F11. Natural Gas Supply and Disposition, Oil and Gas Technological Progress Cases**  
 (Trillion Cubic Feet per Year, Unless Otherwise Noted)

Supply, Disposition, and Prices	1999	Projections								
		2010			2015			2020		
		Slow Technology Progress	Reference	Rapid Technology Progress	Slow Technology Progress	Reference	Rapid Technology Progress	Slow Technology Progress	Reference	Rapid Technology Progress
<b>Lower 48 Average Wellhead Price (1999 dollars per thousand cubic feet)</b>	<b>2.08</b>	<b>2.92</b>	<b>2.69</b>	<b>2.54</b>	<b>3.32</b>	<b>2.83</b>	<b>2.54</b>	<b>4.23</b>	<b>3.13</b>	<b>2.50</b>
<b>Dry Gas Production<sup>1</sup></b>										
U.S. Total .....	18.67	22.75	23.14	23.40	25.44	26.24	26.78	27.11	29.04	30.14
Lower 48 Onshore .....	12.83	15.96	16.29	16.45	17.96	19.04	19.91	19.34	21.26	23.06
Associated-Dissolved .....	1.80	1.32	1.33	1.34	1.28	1.32	1.35	1.35	1.38	1.43
Non-Associated .....	11.03	14.64	14.96	15.11	16.67	17.72	18.55	17.99	19.88	21.63
Conventional .....	6.64	8.27	8.30	8.48	9.42	10.37	10.73	10.31	11.38	11.98
Unconventional .....	4.39	6.38	6.66	6.63	7.25	7.36	7.82	7.68	8.51	9.66
Lower 48 Offshore .....	5.43	6.29	6.34	6.45	6.95	6.66	6.33	7.21	7.21	6.51
Associated-Dissolved .....	0.93	1.05	1.08	1.10	1.00	1.04	1.06	0.98	1.01	1.03
Non-Associated .....	4.50	5.24	5.26	5.35	5.95	5.63	5.27	6.23	6.19	5.47
Alaska .....	0.42	0.50	0.50	0.50	0.54	0.54	0.54	0.57	0.57	0.57
<b>Supplemental Natural Gas<sup>2</sup></b> .....	<b>0.10</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>
<b>Net Imports</b> .....	<b>3.38</b>	<b>5.04</b>	<b>5.06</b>	<b>5.06</b>	<b>5.44</b>	<b>5.50</b>	<b>5.56</b>	<b>5.56</b>	<b>5.80</b>	<b>5.91</b>
<b>Total Supply</b> .....	<b>22.15</b>	<b>27.85</b>	<b>28.25</b>	<b>28.52</b>	<b>30.93</b>	<b>31.80</b>	<b>32.39</b>	<b>32.73</b>	<b>34.90</b>	<b>36.10</b>
<b>Consumption by Sector</b>										
Residential .....	4.72	5.49	5.54	5.58	5.72	5.83	5.90	5.90	6.14	6.29
Commercial .....	3.07	3.74	3.78	3.81	3.86	3.94	3.99	3.83	4.02	4.13
Industrial <sup>3</sup> .....	7.95	9.28	9.33	9.37	9.61	9.76	9.84	9.79	10.18	10.33
Electric Generators <sup>4</sup> .....	3.78	6.71	6.94	7.08	8.86	9.30	9.65	10.15	11.34	12.05
Lease and Plant Fuel <sup>5</sup> .....	1.23	1.47	1.49	1.50	1.64	1.68	1.71	1.75	1.84	1.89
Pipeline Fuel .....	0.64	0.86	0.87	0.89	0.94	0.97	0.99	1.00	1.06	1.10
Transportation <sup>6</sup> .....	0.02	0.09	0.09	0.09	0.13	0.13	0.13	0.15	0.15	0.16
<b>Total</b> .....	<b>21.41</b>	<b>27.65</b>	<b>28.05</b>	<b>28.31</b>	<b>30.76</b>	<b>31.61</b>	<b>32.21</b>	<b>32.57</b>	<b>34.73</b>	<b>35.95</b>
<b>Discrepancy<sup>7</sup></b> .....	<b>0.74</b>	<b>0.20</b>	<b>0.21</b>	<b>0.21</b>	<b>0.18</b>	<b>0.18</b>	<b>0.18</b>	<b>0.17</b>	<b>0.17</b>	<b>0.15</b>
<b>Lower 48 End of Year Reserves</b> .....	<b>157.41</b>	<b>165.16</b>	<b>174.82</b>	<b>181.81</b>	<b>169.68</b>	<b>183.82</b>	<b>205.02</b>	<b>166.49</b>	<b>190.07</b>	<b>223.21</b>

<sup>1</sup>Marketed production (wet) minus extraction losses.

<sup>2</sup>Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

<sup>3</sup>Includes consumption by cogenerators.

<sup>4</sup>Includes all electric power generators except cogenerators, which produce electricity and other useful thermal energy. Includes small power producers and exempt wholesale generators.

<sup>5</sup>Represents natural gas used in the field gathering and processing plant machinery.

<sup>6</sup>Compressed natural gas used as vehicle fuel.

<sup>7</sup>Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 1999 values include net storage injections.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports.

**Sources:** 1999 transportation sector consumption: Energy Information Administration (EIA), AEO2001 National Energy Modeling System runs OGLTEC.D101600A, AEO2001.D101600A, and OGHTEC.D101600A. 1999 natural gas lower 48 average wellhead price, Alaska and total natural gas production, and supplemental gas supplies: EIA, *Natural Gas Monthly*, DOE/EIA-0130(2000/06) (Washington, DC, June 2000). Other 1999 consumption: EIA, *Short-Term Energy Outlook, September 2000*, <http://www.eia.doe.gov/pub/forecasting/steo/oldsteos/sep00.pdf> with adjustments to end-use sector consumption levels for consumption of natural gas by electric wholesale generators based on EIA, AEO2001 National Energy Modeling System runs OGLTEC.D101600A, AEO2001.D101600A, and OGHTEC.D101600A. **Other 1999 values and projections:** EIA, AEO2001 National Energy Modeling System runs OGLTEC.D101600A, AEO2001.D101600A, and OGHTEC.D101600A.

## Results from Side Cases

**Table F12. Crude Oil Supply and Disposition, Oil and Gas Technological Progress Cases**  
 (Million Barrels per Day, Unless Otherwise Noted)

Supply, Disposition, and Prices	1999	Projections								
		2010			2015			2020		
		Slow Technology Progress	Reference	Rapid Technology Progress	Slow Technology Progress	Reference	Rapid Technology Progress	Slow Technology Progress	Reference	Rapid Technology Progress
<b>World Oil Price</b> (1999 dollars per barrel) . . . . .	17.35	21.37	21.37	21.37	21.89	21.89	21.89	22.41	22.41	22.41
<b>Production<sup>1</sup></b>										
U.S. Total . . . . .	5.88	4.87	5.15	5.40	4.70	5.08	5.41	4.63	5.05	5.39
Lower 48 Onshore . . . . .	3.27	2.37	2.46	2.54	2.34	2.52	2.70	2.42	2.64	2.85
Conventional . . . . .	2.59	1.77	1.79	1.82	1.72	1.78	1.86	1.83	1.92	2.04
Enhanced Oil Recovery . . . . .	0.68	0.60	0.66	0.72	0.62	0.74	0.84	0.59	0.72	0.81
Lower 48 Offshore . . . . .	1.56	1.89	2.05	2.18	1.71	1.86	1.96	1.61	1.77	1.85
Alaska . . . . .	1.05	0.61	0.64	0.68	0.66	0.70	0.75	0.59	0.64	0.69
Net Crude Imports . . . . .	8.61	11.89	11.54	11.28	12.28	11.91	11.58	12.57	12.14	11.78
Other Crude Supply . . . . .	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Crude Supply . . . . .	14.80	16.76	16.69	16.67	16.98	16.99	16.99	17.19	17.19	17.17
Natural Gas Plant Liquids . . . . .	1.85	2.31	2.35	2.37	2.55	2.63	2.68	2.70	2.89	3.00
Other Inputs <sup>2</sup> . . . . .	0.60	0.20	0.20	0.22	0.21	0.21	0.22	0.22	0.23	0.23
Refinery Processing Gain <sup>3</sup> . . . . .	0.89	1.05	1.02	1.01	1.08	1.06	1.04	1.13	1.10	1.08
Net Product Imports <sup>4</sup> . . . . .	1.30	2.36	2.38	2.36	3.46	3.33	3.27	4.83	4.37	4.27
Total Primary Supply <sup>5</sup> . . . . .	19.44	22.68	22.64	22.63	24.28	24.21	24.19	26.08	25.79	25.74
<b>Refined Petroleum Products Supplied</b>										
Residential and Commercial . . . . .	1.10	1.07	1.06	1.06	1.04	1.04	1.04	1.02	1.02	1.02
Industrial <sup>6</sup> . . . . .	5.16	5.60	5.58	5.57	5.94	5.89	5.87	6.36	6.23	6.19
Transportation . . . . .	12.86	15.99	15.98	15.98	17.26	17.26	17.26	18.49	18.50	18.50
Electric Generators <sup>7</sup> . . . . .	0.38	0.08	0.07	0.07	0.09	0.07	0.07	0.24	0.08	0.06
Total . . . . .	19.50	22.73	22.70	22.68	24.33	24.26	24.24	26.12	25.83	25.77
Discrepancy <sup>8</sup> . . . . .	-0.07	-0.06	-0.06	-0.06	-0.05	-0.05	-0.05	-0.05	-0.04	-0.04
<b>Lower 48 End of Year Reserves</b> (billion barrels) <sup>1</sup> . . . . .	18.33	13.28	13.92	14.53	12.48	13.50	14.40	12.32	13.48	14.41

<sup>1</sup>Includes lease condensate.

<sup>2</sup>Includes alcohols, ethers, petroleum product stock withdrawals, domestic sources of blending components, and other hydrocarbons.

<sup>3</sup>Represents volumetric gain in refinery distillation and cracking processes.

<sup>4</sup>Includes net imports of finished petroleum products, unfinished oils, other hydrocarbons, alcohols, ethers, and blending components.

<sup>5</sup>Total crude supply plus natural gas plant liquids, other inputs, refinery processing gain, and net petroleum imports.

<sup>6</sup>Includes consumption by cogenerators.

<sup>7</sup>Includes all electric power generators except cogenerators, which produce electricity and other useful thermal energy. Includes small power producers and exempt wholesale generators.

<sup>8</sup>Balancing item. Includes unaccounted for supply, losses and gains.

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports.

**Sources:** 1999 product supplied data from Table A2. Other 1999 data: Energy Information Administration (EIA), *Petroleum Supply Annual* 1999, DOE/EIA-0340(99/1) (Washington, DC, June 2000). **Projections:** EIA, AEO2001 National Energy Modeling System runs OGLTEC.D101600A, AEO2001.D101600A, and OGHTEC.D101600A.

## Results from Side Cases

**Table F13. Petroleum and Natural Gas Supply and Disposition, Oil and Gas Resource Cases**

Supply, Disposition, and Prices	1999	Projections								
		2010			2015			2020		
		Low Resource	Reference	High Resource	Low Resource	Reference	High Resource	Low Resource	Reference	High Resource
<b>Crude Oil</b>										
<b>World Oil Price</b> (1999 dollars per barrel) .....	17.35	21.37	21.37	21.37	21.89	21.89	21.89	22.41	22.41	22.41
<b>Petroleum Supply and Disposition</b> (million barrels per day)										
Crude Oil Production <sup>1</sup> .....	5.88	4.86	5.15	5.41	4.78	5.08	5.31	4.58	5.05	5.45
Onshore .....	3.27	2.32	2.46	2.58	2.29	2.52	2.70	2.38	2.64	2.97
Offshore .....	1.56	1.94	2.05	2.16	1.83	1.86	1.87	1.64	1.77	1.79
Alaska .....	1.05	0.60	0.64	0.67	0.66	0.70	0.74	0.57	0.64	0.70
Net Crude Oil Imports .....	8.61	11.91	11.54	11.24	12.21	11.91	11.68	12.70	12.14	11.72
Natural Gas Plant Liquids .....	1.85	2.22	2.35	2.42	2.43	2.63	2.72	2.45	2.89	3.02
Net Petroleum Product Imports <sup>2</sup> .....	1.30	2.48	2.38	2.35	3.60	3.33	3.23	5.32	4.37	4.24
Other Petroleum Supply <sup>3</sup> .....	1.79	1.26	1.22	1.21	1.32	1.27	1.25	1.40	1.33	1.30
<b>Total Primary Supply</b> .....	<b>19.44</b>	<b>22.73</b>	<b>22.64</b>	<b>22.63</b>	<b>24.33</b>	<b>24.21</b>	<b>24.19</b>	<b>26.44</b>	<b>25.79</b>	<b>25.74</b>
<b>Refined Petroleum Products Supplied</b> .....	<b>19.50</b>	<b>22.79</b>	<b>22.70</b>	<b>22.68</b>	<b>24.38</b>	<b>24.26</b>	<b>24.23</b>	<b>26.49</b>	<b>25.83</b>	<b>25.77</b>
<b>Discrepancy<sup>4</sup></b> .....	<b>-0.07</b>	<b>-0.06</b>	<b>-0.06</b>	<b>-0.05</b>	<b>-0.05</b>	<b>-0.05</b>	<b>-0.04</b>	<b>-0.05</b>	<b>-0.04</b>	<b>-0.03</b>
<b>Lower 48 End of Year Reserves</b> (billion barrels) <sup>1</sup> .....	18.33	13.37	13.92	14.51	12.77	13.50	14.01	12.13	13.48	14.46
<b>Natural Gas</b>										
<b>Lower 48 Average Wellhead Price</b> (1999 dollars per thousand cubic feet) .....	2.08	3.16	2.69	2.44	3.54	2.83	2.55	4.53	3.13	2.62
<b>Natural Gas Supply and Disposition</b> (trillion cubic feet)										
Dry Gas Production <sup>5</sup> .....	18.67	21.83	23.14	23.86	24.26	26.24	27.14	24.60	29.04	30.38
Onshore .....	12.83	15.06	16.29	16.64	16.76	19.04	20.21	18.26	21.26	22.92
Conventional .....	8.43	9.63	9.63	9.86	10.96	11.68	12.30	11.85	12.75	13.39
Unconventional .....	4.39	5.43	6.66	6.78	5.81	7.36	7.91	6.40	8.51	9.54
Offshore .....	5.43	6.26	6.34	6.71	6.96	6.66	6.40	5.77	7.21	6.88
Alaska .....	0.42	0.50	0.50	0.50	0.54	0.54	0.54	0.57	0.57	0.57
Supplemental Natural Gas <sup>6</sup> .....	0.10	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Net Imports .....	3.38	5.63	5.06	4.90	6.21	5.50	5.35	6.69	5.80	5.70
<b>Total Supply</b> .....	<b>22.15</b>	<b>27.51</b>	<b>28.25</b>	<b>28.81</b>	<b>30.53</b>	<b>31.80</b>	<b>32.54</b>	<b>31.35</b>	<b>34.90</b>	<b>36.13</b>
<b>Natural Gas Consumption</b> .....	<b>21.41</b>	<b>27.31</b>	<b>28.05</b>	<b>28.60</b>	<b>30.34</b>	<b>31.61</b>	<b>32.35</b>	<b>31.19</b>	<b>34.73</b>	<b>35.97</b>
<b>Discrepancy<sup>7</sup></b> .....	<b>0.74</b>	<b>0.21</b>	<b>0.21</b>	<b>0.21</b>	<b>0.19</b>	<b>0.18</b>	<b>0.19</b>	<b>0.15</b>	<b>0.17</b>	<b>0.16</b>
<b>Lower 48 End of Year Reserves</b> .....	<b>157.41</b>	<b>154.74</b>	<b>174.82</b>	<b>182.46</b>	<b>159.18</b>	<b>183.82</b>	<b>196.95</b>	<b>148.41</b>	<b>190.07</b>	<b>210.80</b>
<b>Carbon Dioxide Emissions</b> (million metric tons carbon equivalent) .....	<b>1510.8</b>	<b>1806.0</b>	<b>1809.1</b>	<b>1807.6</b>	<b>1924.3</b>	<b>1928.1</b>	<b>1926.2</b>	<b>2033.4</b>	<b>2040.6</b>	<b>2039.1</b>

<sup>1</sup>Includes lease condensate.

<sup>2</sup>Includes net imports of finished petroleum products, unfinished oils, other hydrocarbons, alcohols, ethers, and blending components.

<sup>3</sup>Includes refinery processing gain, strategic petroleum reserve stock additions plus unaccounted for crude oil and crude stock withdrawals minus crude products supplied, alcohols, ethers, petroleum product stock withdrawals, domestic sources of blending components, and other hydrocarbons.

<sup>4</sup>Balancing item. Includes unaccounted for supply, losses and gains.

<sup>5</sup>Marketed production (wet) minus extraction losses.

<sup>6</sup>Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

<sup>7</sup>Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 1999 values include net storage injections.

Note: Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports.

**Sources:** 1999 petroleum supply: Energy Information Administration (EIA), *Petroleum Supply Annual* 1999, DOE/EIA-0340(99/1) (Washington, DC, June 2000). 1999 natural gas lower 48 average wellhead price, production, and supplemental natural gas: EIA, *Natural Gas Monthly*, DOE/EIA-0130(2000/06) (Washington, DC, June 2000). 1999 carbon dioxide emissions: EIA, *Emissions of Greenhouse Gases in the United States* 1999, DOE/EIA-0573(99) (Washington, DC, October 2000). Other 1999 values: EIA, Office of Integrated Analysis and Forecasting. **Projections:** EIA, AEO2001 National Energy Modeling System runs OGLRES.D111400A, AEO2001.D101600A, and OGHRES.D111400A.

## Results from Side Cases

**Table F14. Key Results for MTBE Reduction Case**

Change in Gasoline Blending, Imports, and Prices	1999	2004			2005			2006		
		Reference Case	MTBE Ban	Change from Reference	Reference Case	MTBE Ban	Change from Reference	Reference Case	MTBE Ban	Change from Reference
<b>MTBE Blended with Gasoline (thousand barrels per day)</b> .....	281	214	0	-214	220	0	-220	223	0	-223
<b>Ethanol Blended with Gasoline (thousand barrels per day)</b>										
United States .....	91	139	194	55	144	196	52	145	198	53
California .....	N/A	68	36	-32	70	37	-33	70	37	-33
<b>Net Petroleum Product Imports (million barrels per day)</b> .....	1.30	1.51	1.68	0.17	1.56	1.76	0.2	1.74	1.89	0.15
<b>Net Crude Oil Imports (million barrels per day)</b> .....	8.61	10.24	10.06	-0.18	10.59	10.37	-0.22	10.89	10.74	-0.15
<b>Gasoline Prices (1999 cents per gallon)</b>										
National Average Gasoline Price .....	118	132	136	4	133	136	3	135	139	4
National Average Reformulated Gasoline Price .....	125	139	147	8	139	147	8	142	151	9

MTBE = Methyl tertiary butyl ether.

N/A = Not applicable.

Note: Side case was run without the fully integrated modeling system, so not all potential feedbacks are captured.

Source: Energy Information Administration, AEO2001 National Energy Modeling System runs AEO2001.D101600A and MTBEBAN5.D101900A.

**Table F15. Key Results for Coal Mining Cost Cases**

Prices, Productivity, Wages, and Emissions	1999	2005			2010			2020		
		Low Cost	Reference Case	High Cost	Low Cost	Reference Case	High Cost	Low Cost	Reference Case	High Cost
<b>Minemouth Price (1999 dollars per short ton)</b> .....	16.98	13.90	14.68	15.39	12.48	13.83	14.99	10.84	12.70	15.18
<b>Delivered Price to Electric Generators (1999 dollars per million Btu)</b> .....	1.21	1.10	1.13	1.17	0.99	1.05	1.12	0.88	0.98	1.11
<b>Labor Productivity (short tons per miner per hour)</b> .....	6.59	9.16	8.30	7.50	10.98	9.16	7.75	14.20	10.31	7.47
<b>Labor Productivity (average annual growth from 1999)</b> .....	N/A	5.6	3.9	2.2	4.8	3.0	1.5	3.7	2.2	0.6
<b>Average Coal Miner Wage (1999 dollars per hour)</b> .....	19.34	18.77	19.34	19.93	18.30	19.34	20.43	17.41	19.34	21.48
<b>Average Coal Miner Wage (average annual growth from 1999)</b> .....	N/A	-0.5	0.0	0.5	-0.5	0.0	0.5	-0.5	0.0	0.5
<b>Carbon Dioxide Emissions by Electric Generators (million metric tons carbon equivalent)<sup>1</sup></b>										
Petroleum .....	20.0	6.6	6.7	6.7	3.4	3.4	3.5	3.7	3.7	3.8
Natural Gas .....	45.8	77.9	78.5	78.5	100.5	101.8	103.6	164.6	166.3	169.0
Coal .....	490.5	549.6	547.9	548.0	577.7	574.0	569.3	606.6	601.5	592.9
Total .....	556.3	634.1	633.1	633.2	681.6	679.1	676.4	775.0	771.5	765.7
<b>Electric Generator Capability (gigawatts)</b> .....	744.6	819.1	818.6	819.2	933.5	934.3	933.1	1059.5	1060.7	1059.5

<sup>1</sup> Excludes cogenerators and other generators.

Btu = British thermal unit.

N/A = Not applicable.

Note: Side cases were run without the fully integrated modeling system, so not all potential feedbacks are captured. Totals may not equal sum of components due to independent rounding. Data for 1999 are model results and may differ slightly from official EIA data reports.

Source: Energy Information Administration, AEO2001 National Energy Modeling System runs LMCST01.D101900A, AEO2001.D101600A, and HMCST01.D101900A.